

CLAIMS

1. A metal material for machine parts for use in a casting machine for casting an article from a molten aluminum alloy, comprising a steel base, a Ni alloy layer formed on a surface of the base, and titanium carbide (TiC) bonded in a particulate state to the surface of the Ni alloy layer.
2. The metal material for parts of a casting machine according to claim 1, wherein the TiC particles are partly exposed on the surface of the Ni alloy layer.
3. The metal material for parts of a casting machine according to claim 2, wherein the gaps in the TiC particles are filled in with fine ceramic particles comprising at least one of boron nitride (BN), alumina (Al_2O_3) and zirconia (ZrO_2).
4. The metal material for parts of a casting machine according to claim 1, wherein the Ni alloy has the composition of 2.6 to 3.2 % of B, 18 to 28 % of Mo, 3.6 to 5.2 % of Si and 0.05 to 0.22 % of C, with the remainder being Ni and unavoidable impurities.
5. A molten aluminum alloy-contact member for use in a casting machine for casting an article from a molten aluminum alloy, comprising a body, composed of a steel base and a nickel alloy layer formed on a surface of the base on the side to be in direct contact with a molten aluminum alloy, and titanium carbide (TiC) bonded in a particulate state to the surface of the Ni alloy layer.
6. The molten aluminum alloy-contact member according to claim 5, wherein the TiC particles are partly exposed on the surface of the Ni alloy layer.
7. The molten aluminum alloy-contact member

according to claim 6, wherein the gaps in the TiC particles are filled in with fine ceramic particles comprising at least one of boron nitride (BN), alumina (Al_2O_3) and zirconia (ZrO_2).

8. The molten aluminum alloy-contact member according to claim 5, wherein the Ni alloy has the composition of 2.6 to 3.2 % of B, 18 to 28 % of Mo, 3.6 to 5.2 % of Si and 0.05 to 0.22 % of C, with the remainder being Ni and unavoidable impurities.

9. The molten aluminum alloy-contact member according to any one of claims 5 to 8, wherein said member is a machine part having a surface to be in direct contact with a molten aluminum alloy, such as a conduit, a mold, a sleeve or an insert.

10. A method for producing a molten aluminum alloy-contact member for use in a casting machine for casting an article from a molten aluminum alloy, comprising the steps of: forming a Ni alloy layer on a surface of a steel base, thereby forming a body; burying the body in TiC powder; and placing the body, together with the TiC powder, in a vacuum heating oven and heating them under vacuum to a temperature at which a liquid phase generates from the Ni alloy, thereby bonding the TiC particles to the surface of the Ni alloy layer.

11. The method for producing a molten aluminum alloy-contact member according to claim 10, wherein after the bonding of the TiC particles to the Ni alloy layer, the member is subjected to a process comprising applying a slurry of a mixture of a binder and a fine ceramic powder comprising at least one of boron nitride (BN), alumina (Al_2O_3) and zirconia (ZrO_2) to the TiC particles, and burning the ceramic powder into the surface of the member.

12. The method for producing a molten aluminum

alloy-contact member according to claim 10, wherein the average particle diameter of the TiC powder is in the range of 10 - 500 nm.

13. The method for producing a molten aluminum alloy-contact member according to claim 10, wherein the Ni alloy layer is formed by thermal spraying of a Ni alloy having the composition of 2.6 to 3.2 % of B, 18 to 28 % of Mo, 3.6 to 5.2 % of Si and 0.05 to 0.22 % of C, with the remainder being Ni and unavoidable impurities.